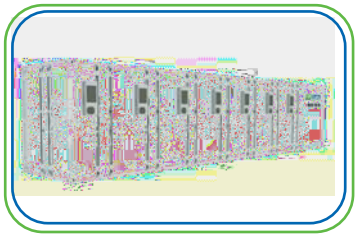
E5031 Catalogue

Battery Energy Storage System







For Reliable, Secure and Economical Energy System Operation

Dongfang Electronics International Engineering Co., Ltd.

Dongfang Electronics Co., Ltd.

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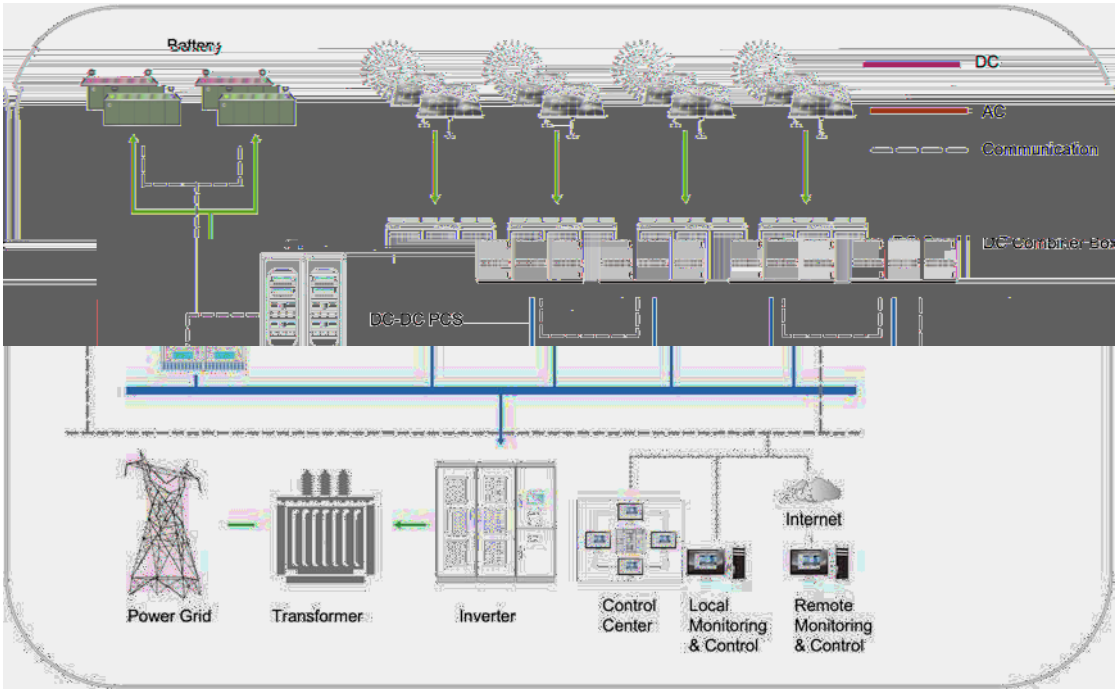
1 Application

1.1 Generation Side

The wind and solar energy have features of seasonality and temporality. When a large amount of wind and solar generated electricity power connect to the power grid simultaneously, it may cause power surplus problem, which could lead to solar & wind power abandonment. The addition of BESS on the side of renewable energy generation can solve these problems well by the way to store the electricity that could not be consumed and discharge it at the time of insufficient power generation or peak consumption, so as to smooth the generation of electricity, make up for the defects of unstable renewable energy power generation and avoid waste of power.

1.1.1 DC Busbar Solution



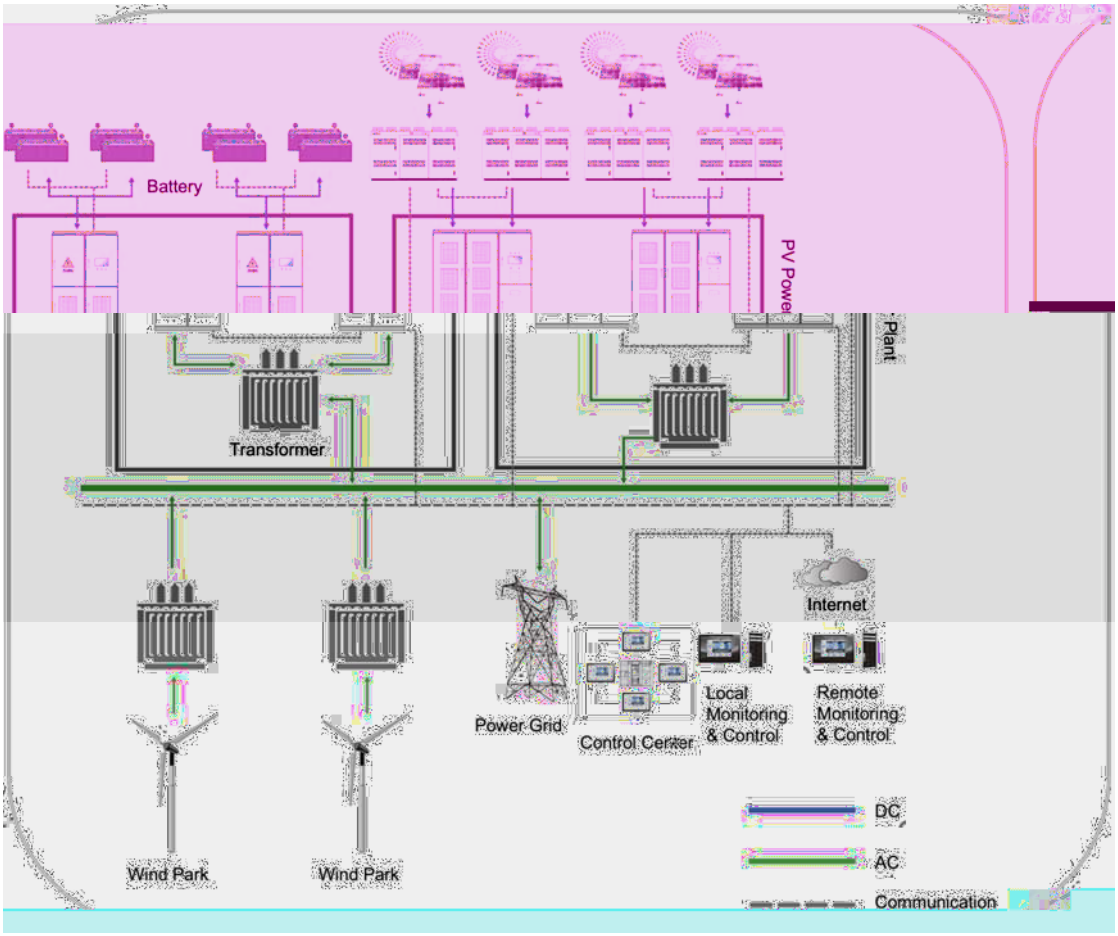
Features

Products

E5023 Series

Container Energy Storage System

1.1.2 AC Busbar Solution



Features

Reduce the solar & wind power abandonment
Smooth energy output
Dispatching flexible
Fast Response to dispatching command
Enhance the stability & plannability when connected to the power grid
Suitable to Middle & Large System

Products

E5020-500-12
E5020-630-12
E5022-1725-10
E5030-(6-35)/2500
E5030-(6-35)/3450
Container Energy Storage System

1.1.3 Thermal and BESS Joint Frequency Regulation Solution

At the level of power production and operation, with large thermal power units as the main frequency regulation resources, a large number of thermal power units bear the heavy AGC adjustment task for a long time, resulting in a series of negative effects such as increased coal consumption and serious equipment wear. Because of the fast frequency regulation speed and adjustable capacity, BESS becomes a very good frequency regulation resource. After adding BESS in thermal power plant, it can effectively improve Kp (power reserve coefficient) value in practical application, reduce the loss of thermal units as the frequent regulation, and increase the flexibility of unit operation.

Features

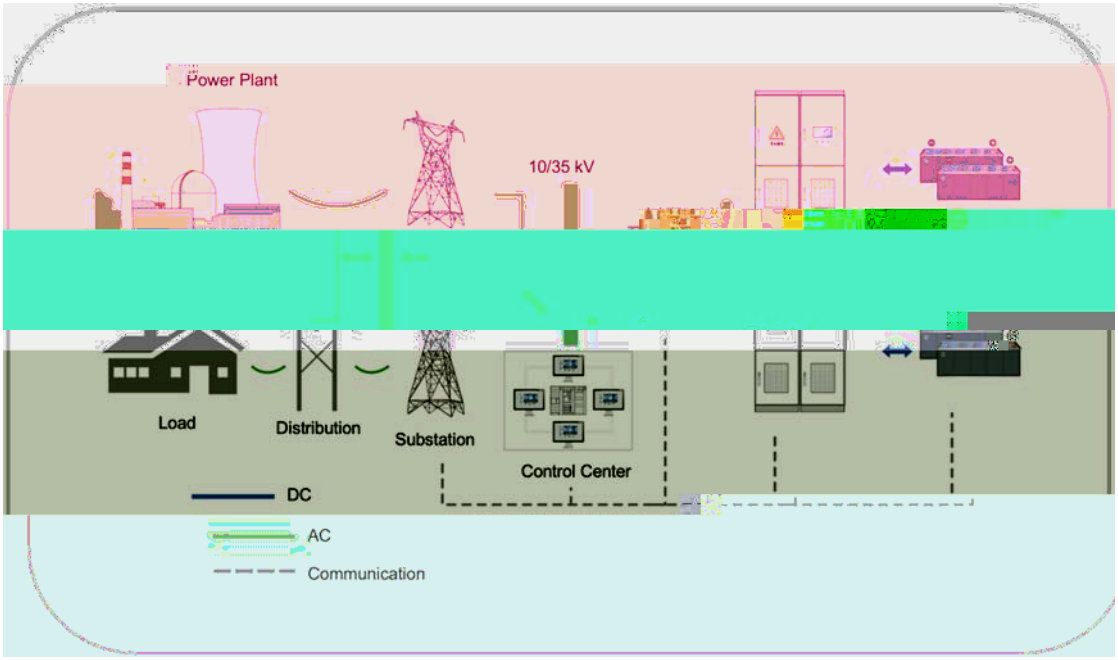
- Slow down thermal power unit wear
- Prolong unit life
- Increase power plant income
- Ability as black start power supply
- Improve the reliability of power supply system

Products

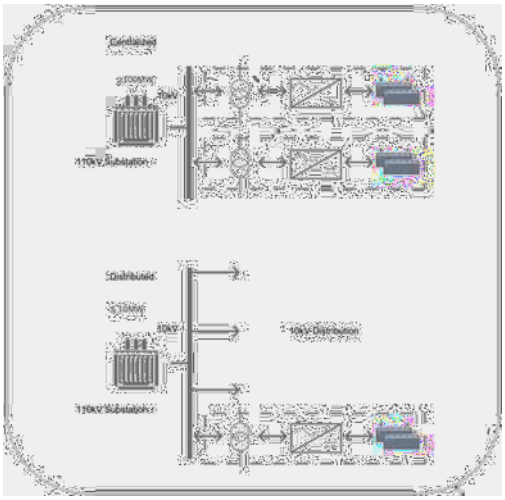
E5020-500-12
E5020-630-12
E5022-1725-10

1.2 Power Grid Side

In recent years, the peak-valley difference of power grid load has increased year by year, the installed capacity of renewable energy has been increasing, the load has repeatedly reached a new high, and the peak regulation pressure is large. The power grid side BESS solution effectively solves the problems of poor power grid regulation capacity and weak distribution power grid construction through frequency regulation and peak regulation on the power grid side.



Layout Mode



Features

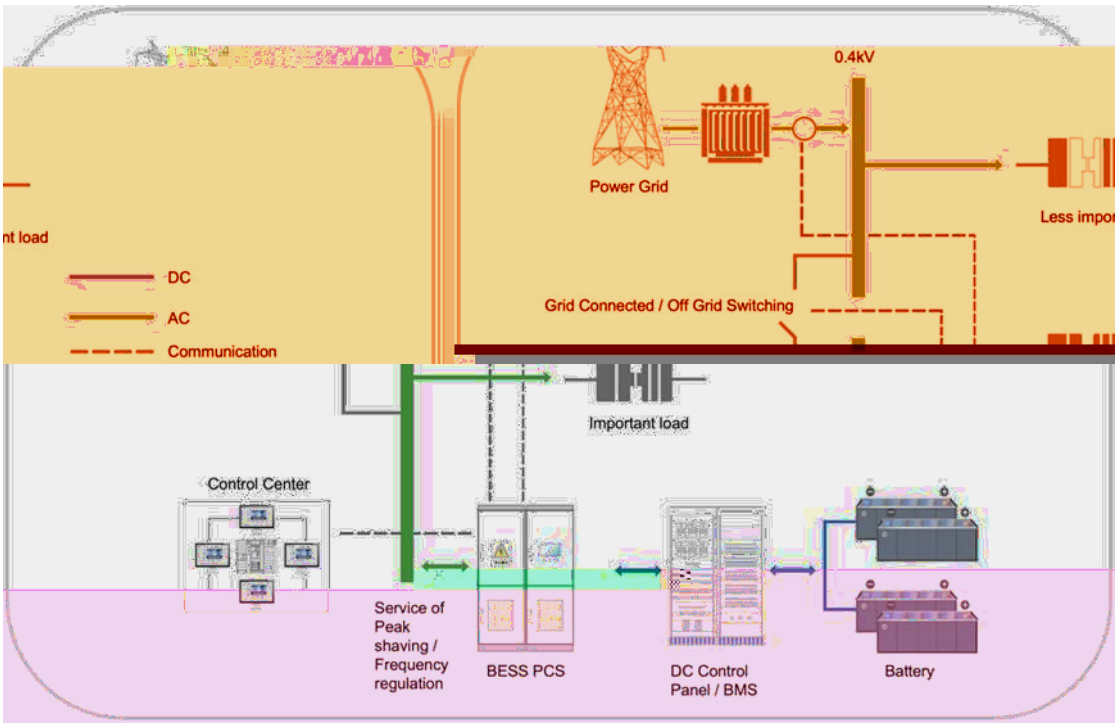
Defer the power grid expansion
Improve the stability of the power grid
Dynamic response speed is fast
Improve power quality
Assist renewable energy grid connection
Emergency reserve
Reduce line loss

Products

E5020-500-12
E5020-630-12
E5022-1725-10
E5030-(6-35)/2500 E5030-(6-35)/3450
Container Energy Storage System

1.3 Users Side

1.3.1 Industrial/Commercial BESS Solution



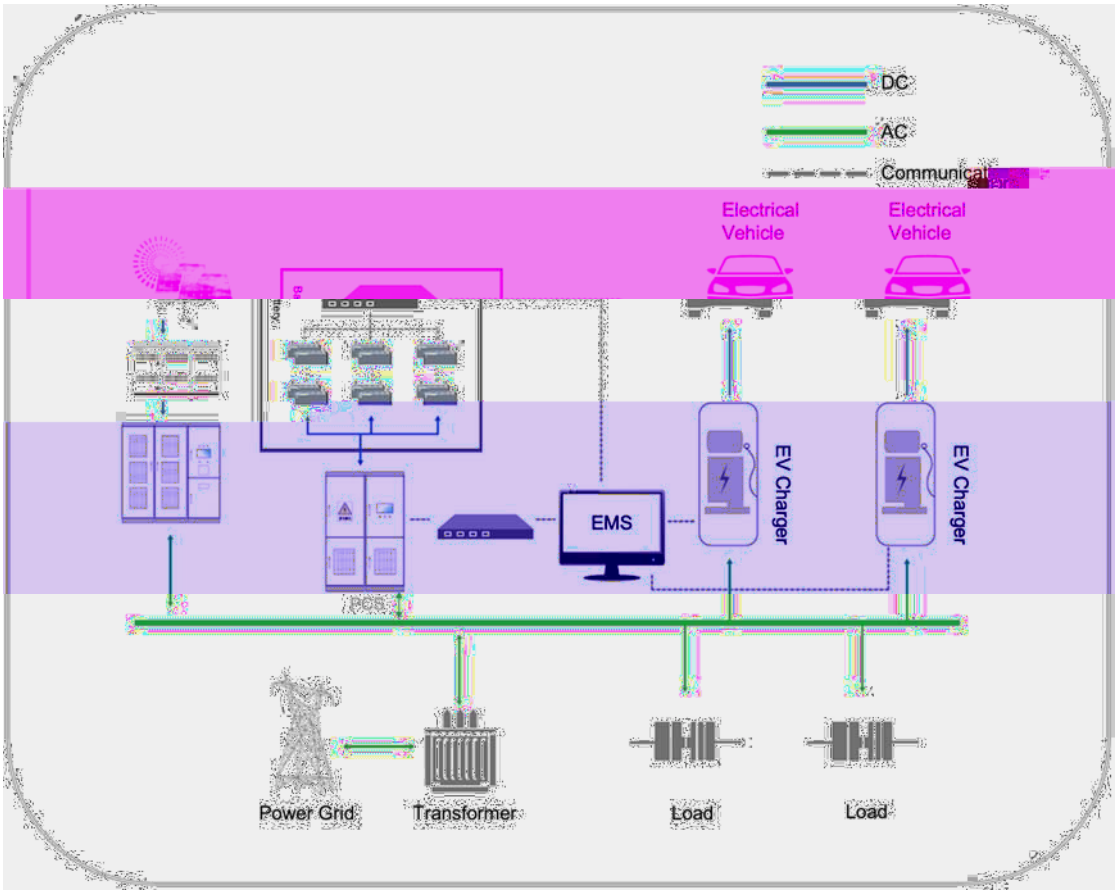
Suitable to

- Shopping mall
- Workshop
- Enterprise
- Smart building

Features

- AC grid, easy to connect
- Highly integrated, flexible layout, small space needed
- Peak shaving
- Reduce demand electricity cost
- Smooth load
- Defer capacity expansion
- Emergency power supply

1.3.2 Photovoltaic-BESS-Charging Solution



Suitable to

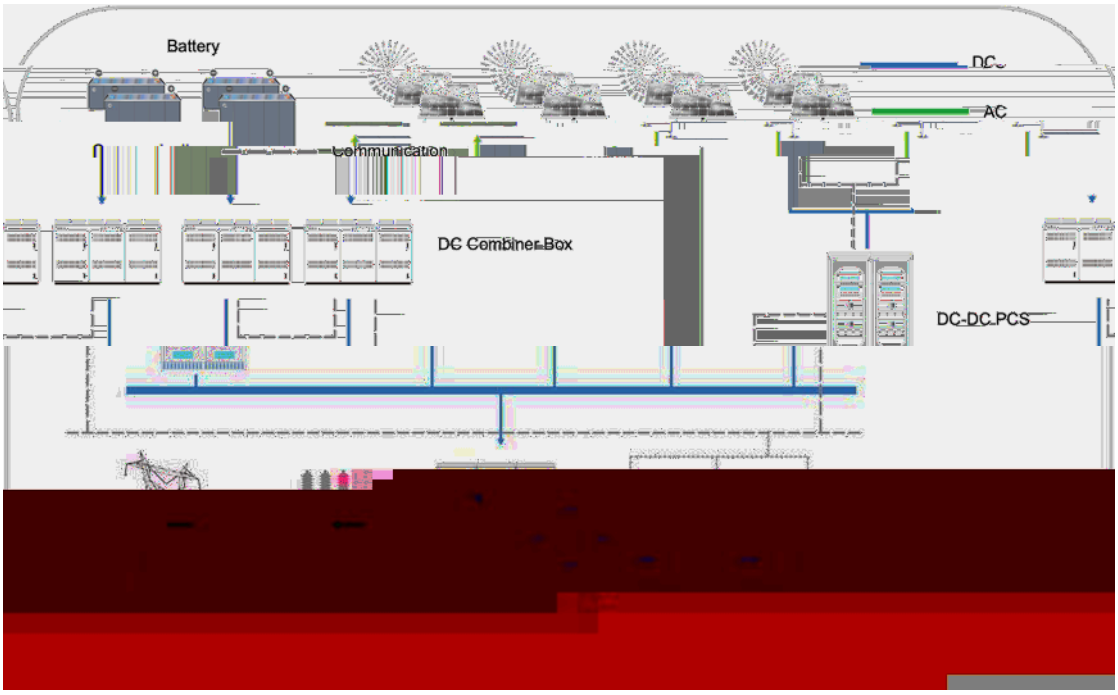
Industrial Park
Shopping Mall
Workshop
Enterprise
……

Features

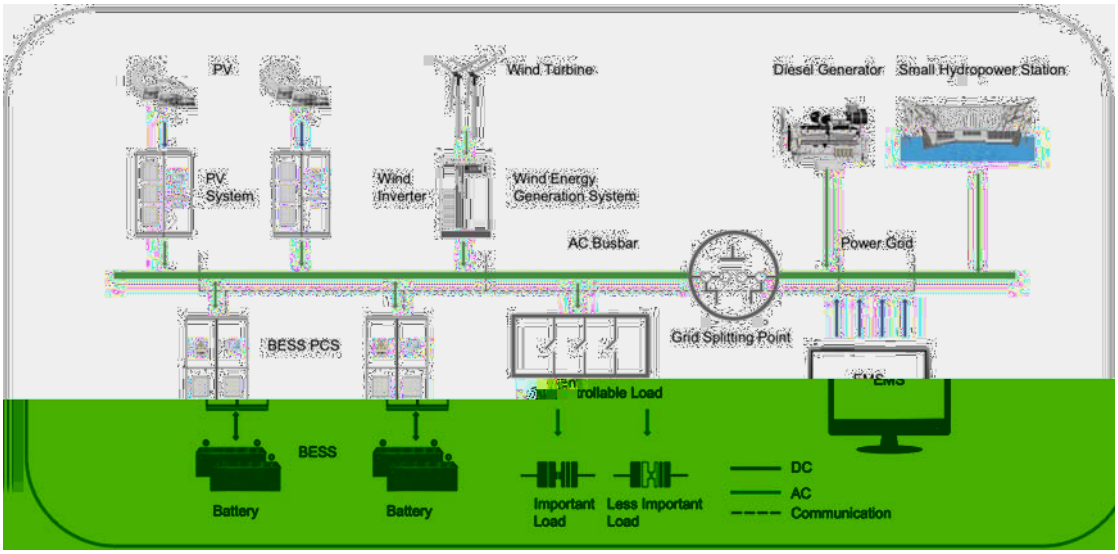
Improve power quality
Smooth charging peak current
Highly integrated, flexible layout, small space needed
Peak shaving
Reduce demand electricity cost
Smooth load
Defer capacity expansion
Emergency power supply

1.4 Micro-Grid

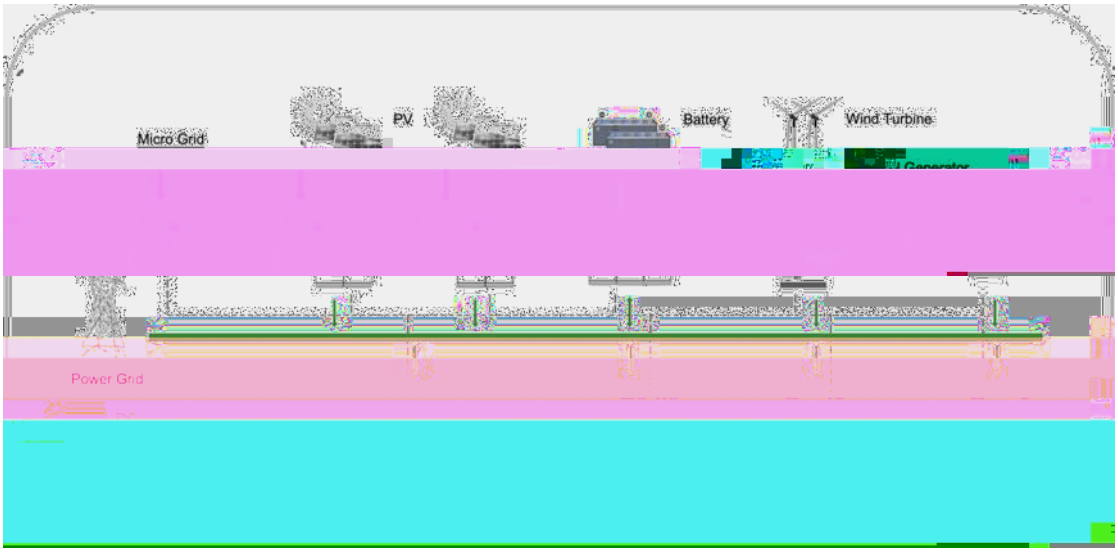
1.4.1 DC Busbar Solution



1.4.2 AC Busbar Solution



1.4.3 No-Power Area Solution



Suitable to

- Remote and no power area
- Island
- Industrial park

Features

- Multi-energy complementation
- Improve power quality
- Highly integrated, flexible layout, small space needed
- Smooth load
- Emergency power supply

2 PRODUCT

2.1 E5020 1000V Power Conversion System (PCS)

Functions

Smooth the fluctuation of renewable energy generation

Assist frequency regulation in thermal power plants

User side TOU (Time Of Use) price management, capacity cost management

Improve power supply reliability and power quality in microgrid

Features

Flexible I/O expansion, system upgrade, replacement

The string design enables one-to-one accurate management of battery clusters

Adopt high-performance, highly reliable protection and control platform

Adopt high-quality components to ensure safe and reliable operation of the equipment

High precision PQ decoupling control and virtual synchronous generator control algorithm are adopted

Perfect and reliable protection function

CAN, RS485, Ethernet and other communication interfaces, easy to connect with various communication methods

Suitable for high altitude applications (less than 6000m, derating over 2500m)

Technical Specification

Type	E5020-100-12	E5020-200-12	E5020-300-12	E5020-500-12	E5020-630-12
DC Parameters					
Battery Voltage Range	580Vdc-850Vdc				600Vdc-900Vdc
Maximum	180A	360A	550A	930A	1200A

Charge/Discharge Current					
AC (Grid-Connected)					
Rated Output Power	100kW	200kW	300kW	500kW	630kW
Maximum Apparent Power	110kVA	220kVA	330kVA	550kVA	693kVA
Rated Voltage	400Vac				
Power Grid Voltage Range Acceptable	-15%~10% (Adjustable)				
Rated Current	144A	288A	433A	722A	909A
Maximum Output Current	158A	317A	476A	800A	1000A
Power Factor / Range adjustable	>0.99 (Rated Output Power)/1 (leading)~1 (lagging)				
Frequency Range	50/60Hz				
Wiring	3-Phase 3-Wire / 3-Phase 4-Wire				
AC (Off-Grid)					
Rated Voltage	400Vac				
Rated Frequency	50/60Hz				
THDi	Total Harmonic Current Distortion <3% (Rated Output Power)				
Over Load Capacity Permanent	110%				
General Parameters					
IP	IP20				
Noise	<75dB				
Operation Temperature	-30 -50				
Cooling Mode	Air Cooling with Intelligent temperature control				
Relative Humidity	0-95% (non-condensing)				
Operation Altitude	6000m (derating over 2500m)				
Dimension(Width/ Depth/Height)	800/900/1600			1200/900/2200	
Weight	300kg	400kg	500kg	750kg	1000kg
Isolation Transformer	N/A				
Display and Communication					
Display	Touch LCD				
Interface with BMS	RS485/CAN				
Interface with Local	RS485 TCP/IP				

2.2 E5030 1000V Battery-PCS-Step-up Transformer All-in-one System

Features

Highly integrated, unified interface, reasonable and efficient layout
The step-up voltage covers 35kV and below
Support multi-machine parallel
1000V system wide DC voltage range
With 1P54 protection level, it can adapt to a variety of outdoor scenes
Battery and PCS cabinets are designed in separate compartments, east to maintain
Compatible with various power levels and flexible configuration of various capacities

Technical Specification

Type	E5030-(6-35)/1000	E5030-(6-35)/1250	E5030-(6-35)/2000	E5030-(6-35)/2500
DC Parameters				
Operation Voltage Range	600Vdc-900Vdc			
Maximum Current	1860A	2400A	3720A	4800A
AC (Grid-Connected)				
Rated Output Power	1000kW	1260kW	2000kW	2500kW
Maximum Output Power	1100kVA	1386kVA	2200kVA	2750kVA

Rated Grid-connected Voltage	400Vac			
Power Grid Voltage Range Acceptable	-15%~10% (Adjustable)			
Rated Frequency	50Hz/60Hz			
Maximum Output Current	1588A	2000A	3176A	4000A
Power Factor	>0.9 (Rated Output Power) /1 (Leading) ~1 (Lagging)			
THDi	Total Harmonic Current Distortion <3% (Rated Output Power)			
AC(Off-Grid				
Rated Output Voltage	400Vac			
Output Voltage Accuracy	1%			
Rated Output Power	397A	500A	794A	1000A
THDu	Total Harmonic Voltage Distortion <1% (Linear load)			
Rated Frequency	50Hz/60Hz			
Overload Capability	110%			
Efficiency				
Maximum Efficiency	98.25%			
Transformer Parameters				
Rated Power	1000kW	1260kW	2000kW	2500kW
Voltage Ratio	0.4/6~35kV			
Type	Oil/Dry			
General Parameters				
IP	IP54			
Operation Temperature	-35 ~60 (derating over 50)			
Relative Humidity	0~100% (non-condensing)			
Cooling Mode	Intelligent air cooling			
Dimension(Width/Depth/Height)	6058×2896×2800mm			
Weight	15000kg			
Operation Altitude	6000m (derating over 2500m)			
Display and Communication				
Display	Touch LCD			
Interface with BMS	RS485/CNA			
Interface with Local	RS485 TCP/IP			

2.3 E5022 1500V Power Conversion System (PCS)

Functions

Smooth the fluctuation of renewable energy generation

Assist frequency regulation in thermal power plants

User side TOU (Time Of Use) price management, capacity cost management

Improve power supply reliability and power quality in microgrid

Features

Flexible I/O expansion, system upgrade, replacement

The string design enables one-to-one accurate management of battery clusters

Adopt high-performance, highly reliable protection and control platform

Adopt high-quality components to ensure safe and reliable operation of the equipment

High precision PQ decoupling control and virtual synchronous generator control algorithm are adopted

Perfect and reliable protection function

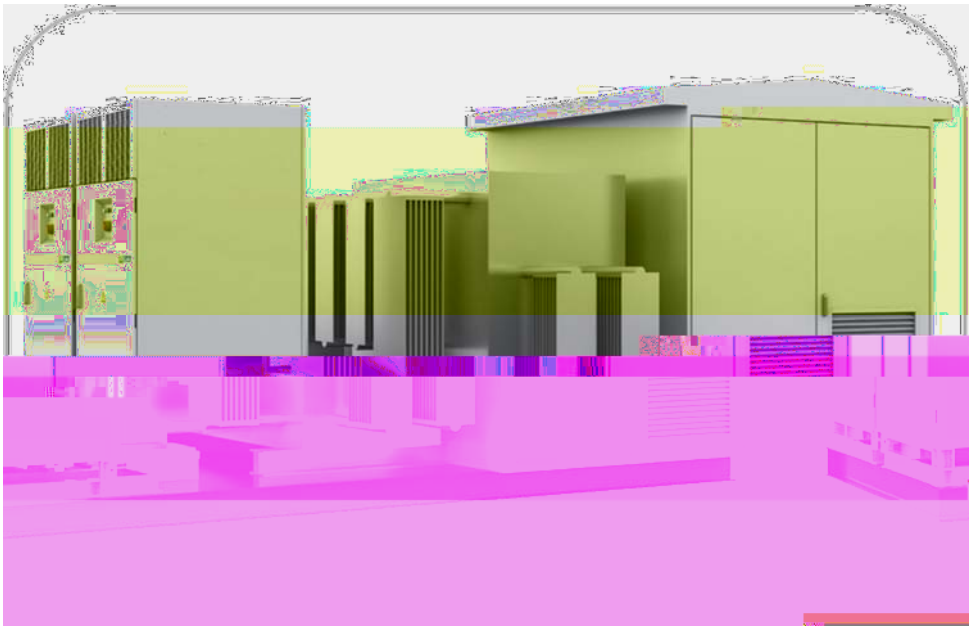
CAN, RS485, Ethernet and other communication interfaces, easy to connect with various communication methods

Technical Specification

Item	Type	Specification			
		E5022-1250-10	E5022-1375-10	E5022-1668-10	E5022-1725-10
DC Parameters	Maximum Voltage	1500Vdc			
	Operation Voltage Range	1000-1500 Vdc			
	Maximum Current	1375A	1513A	1835A	1898A
AC (Grid-Connected)	Rated Output Power	1250kW	1375kW	1688kW	1725kW
	Maximum Output Power	1375kW	1513kVA	1835kVA	1897 kVA
	Rated Grid-connected Voltage	500Vac	550 Vac	690Vac	690Vac

	Power Grid Voltage Range Acceptable	-15%~10% (Adjustable)			
	Rated Frequency	50Hz/60Hz			
	Maximum Output Current	1151A	1266A	1535A	1588A
	Power Factor	-1~1			
	THDi	Total Harmonic Current Distortion <3% (Rated Output Power)			
AC(Off-Grid	Rated Output Voltage	690Vac			
	Output Voltage Accuracy	1%			
	Rated Output Power	1250kW	1375kW	1688kW	1788 kW
	THDu	Total Harmonic Voltage Distortion <1.2% (Linear Load)			
	Rated Frequency	50Hz/60Hz			
	Overload Capability	110%			
Efficiency	Maximum Efficiency	99.05%			
General	IP	IP54			
	Operation Temperature	-30 ~60 (derating over 50)			
	Relative Humidity	0~95% (non-condensing)			
	Cooling Mode	Forced air cooling (intelligent fan speed adjustment)			
	Dimension(Width/Depth/Height)	1080*2100*870 mm			
	Weight	≤1500kg			
	Operation Altitude	4000m (derating over 2000m)			
	Isolation Transformer	N/A			
Others	Display	Touch LCD			
	Interface with BMS	RS485/CAN			
	Interface with Local	RS485 TCP/IP			

2.4 E5030 1500V Battery-PCS-Step-up Transformer All-in-one System



Features

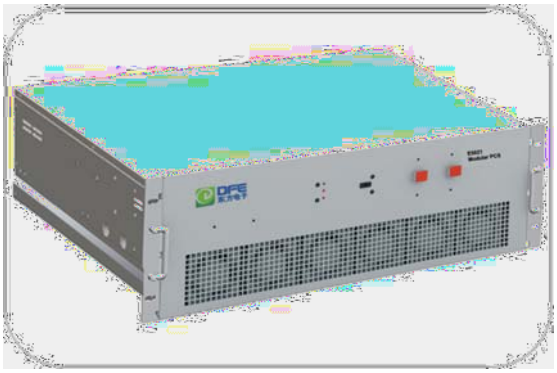
Highly integrated, unified interface, reasonable and efficient layout
The step-up voltage covers 35kV and below
Support multi-machine parallel
1500V system Wide DC voltage range
With 1P54 protection level, it can adapt to a variety of outdoor scenes
Battery and PCS cabinets are designed in separate compartments, east to maintain
Compatible with various power levels and flexible configuration of various capacities

Technical Specification

Type	E5030-(6-35)/ 2500	E5030-(6-35)/ 300	E5030-(6-35)/ 3450
DC Parameters			
Operation Voltage Range	1500Vdc		
Maximum Voltage	800Vdc~1500Vdc	800Vdc~1500Vdc	800Vdc~1500Vdc
AC Grid-Connected			
Rated Output Power	2500kW	3000kW	3450kW
Maximum Output Power	2750kVA	3300kVA	3795kVA
Rated Grid-connected Voltage	550Vac	600Vac	690Vac
Power Grid Voltage Range Acceptable	-15%-10% (Adjustable)		
Rated Frequency	50Hz/60Hz		
Maximum Output Current	2886A	3176A	3176A

Power Factor (Range Adjustable)	>0.9 (Rated Output Power) /0.8 (Leading) ~0.8 (Lagging)		
THDi	Total Harmonic Current Distortion <3% (Rated Output Power)		
AC(Off-Grid			
Rated Output Voltage	550Vac	600Vac	690Vac
Output Voltage Accuracy	1%		
Rated Output Power	2886A	3176A	3176A
THDu	Total Harmonic Voltage Distortion <1.2% (Linear Load)		
Rated frequency	50Hz/60Hz		
Overload Capability	110%		
Efficiency			
Maximum Efficiency	99.03%		
Transformer Parameters			
Rated Capacity	2500kVA	3000kVA	3450kVA
Voltage Ratio	0.55/6~35kV	0.6/6~35kV	0.69/6~35kV
Type	Oil/Dry		
General Parameters			
IP	IP54		
Operation Temperature	-35 ~60 (derating over 50)		
Relative Humidity	0~95%		
Cooling Mode	Intelligent air cooling		
Dimension(Width/Depth/Height)	6058×2896×2438mm		
Weight	15000kg		
Operation Altitude	4000m (derating over 2000m)		
Display	Touch LCD		
Interface with BMS	Modbus-RTU/Modbus-TCP/IEC61850/IEC104		
Interface with Local	RS485/Ethernet		

2.5 E5021 Modular Power Conversion System (PCS)



Features

Battery configuration is flexible and scalable

Integrated structure, simple, beautiful, easy to install

Adopt high-performance, highly reliable control and protection platform

Adopt high-quality components to ensure safe and reliable operation of the equipment

Adopt high precision sampling and advanced and flexible control algorithm

Perfect and reliable protection function

CAN, RS485, Ethernet and other communication interfaces, easy to connect with various communication methods

Suitable for high altitude applications (less than 6000 m, derating over 2500 m)

Technical Specification

Item	Details	Specification
Type	E5021-100-10	
DC	Battery Voltage Range	580Vdc-850Vdc
	Maximum Charge/De-Charge Current	180A
AC (Grid-Connected)	Rated Output Power	100 kW
	Maximum Apparent Power	110kVA
	Rated Voltage	400Vdc
	Rated Current	144A
	Maximum Output Current	158A
	Frequency Range	50/60Hz
	Wiring	3-Phase 3-Wire / 3-Phase 4-Wire
AC (Off-Grid)	Rated Voltage	400Vac
	Rated Frequency	50/60Hz
	Total Harmonic Voltage Distortion THDu	<1% (linear) <5% (non-linear)

	Over Load Capacity Permanent	110%
General	IP	IP20
	Noise	<75dB
	Operation Temperature	-30 -50
	Cooling Mode	Air Cooling with intelligent temperature control
	Relative Humidity	0-95% (non-condensing)
	Operation Altitude	6000m (derating over 2500m)
	Dimension (Width/Depth/Height)	700/750/220
	Weight	70kg
	Isolation Transformer	N/A
Others	Display	LED
	Interface with BMS	RS485/CAN
	Interface with Local	RS485 TCP/IP

2.6 E5023 DC-DC Power Conversion System (PCS)

Features

Ultra-wide DC voltage range

Support a variety of battery types, complete power conversion and battery protection functions

Support multi-machine parallel

Technical Specification

Type	E5023-100-10	E5023-200-10	E5023-250-10
Input Parameters			
Rated Input Power	100kW	200kW	250kW
Input Voltage Range	310~1000Vdc	310~1000Vdc	310~1000Vdc
Full Load Operation Voltage Range	350~850Vdc	350~850Vdc	350~850Vdc
Maximum Operation Current	275A	416A	444A
Battery Parameters			
Battery Voltage Range	310~1000Vdc	310~1000Vdc	310~1000Vdc
Full Load Operation Voltage Range	350~850Vdc	450~850Vdc	600~850Vdc
Maximum Operation Current	275A	416A	444A
Efficiency			
Maximum Efficiency	99%	99%	99%
General Parameters			
Dimension(Width/Depth/Height)	800×2000×800mm		
Weight	500kg		
IP	IP20		
Operation Temperature	-30~60 (derating over 55)		
Cooling Mode	Air cooling		
Relative Humidity	0~95% (non-condensing)		
Operation Altitude	6000m (derating over 2500m)		
Display	Touch LCD		
Communication Interface	RS485/CAN/Ethernet		
Multi-Machine Parallel Operation	Supported		

2.7 E5030 Compact All-in-one BESS

Features

Integrates PCS, EMS and battery systems to perfectly adapt to various application scenarios

With 1P54 protection grade, it can adapt to a variety of outdoor environments

Battery and PCS compartment separately design, easy to maintain

Smaller size, compact design and higher power density

Technical Specification

Type	E5030-25/50	E5030-50/100	E5030-100/200	E5030-150/300
Rated Power	25	50	100	150
AC Rated Voltage	400			
AC Connection Mode	3+N+PE			
Power Grid Frequency	50/60Hz			
Battery Capacity	50	100	200	300
DC Range	200~850	200~850	600~850	600~850
Number of Battery Branch	1	2	3	4
Temperature Range	-20 ~+50			
IP	IP54			
Out Door Cabinet Dimension (Width/Depth/Height)	<10 feet outdoor container			

2.8 Industrial & Commercial Compact BESS

Industrial & commercial compact BESS adopts modular design, improves system voltage through series battery modules, and expands capacity in parallel with multiple cabinets.

The products are suitable for microgrid, industrial and commercial energy storage and other scenarios, can be compatible with different system architectures such as grid-connected and off-grid.

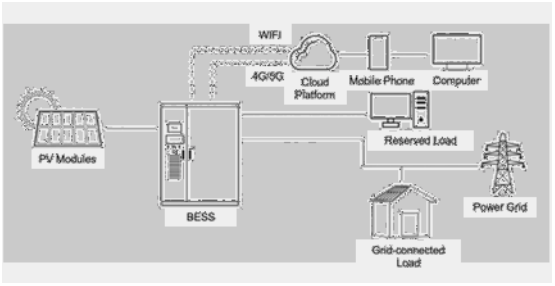
With double leakage protection and AC/DC hardware isolation design, it is safer for users.

Inverter convection heat dissipation design, more friendly to high temperature working environment.

Thin and light design, easy to be installed.

Equipped with an intelligent network monitoring platform and APP, easy to monitor real-time operation status.

Built-in DC/AC safety isolation system for easy transportation and installation.



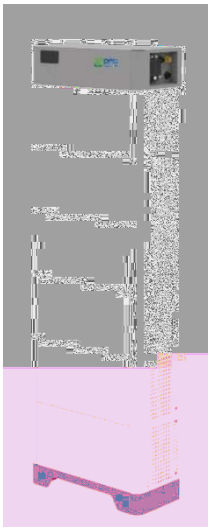
Technical Specification

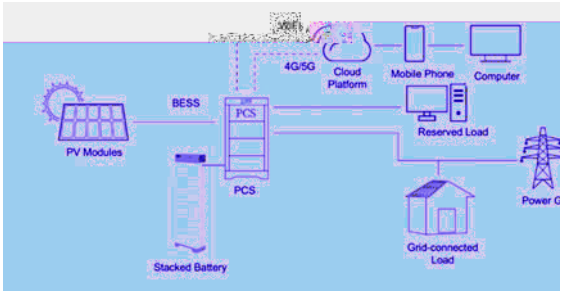
Item	Details	Specification	
		Product A	Product B
PACK	Battery Type	LFP	LFP
	Nominal Battery Voltage[V]	768	768
	Voltage Range[V]	54-73	43.2-58.4

	Maximum Charge & Discharge Current[A]	57/83	114/166
	Battery Capacity[Ah]	150	280
	Energy Capacity[kWh]	115.2	215.04
	Capacity Available[kWh]	103.68	193.53
	Communication Interface	RS485/CAN	RS485/CAN
AC (Grid-Connected)	Wiring	3-Phase 4-Wire/3-Phase 3-Wire	3-Phase 4-Wire/3-Phase 3-Wire
	Maximum Output Power[kVA]	55	110
	Nominal Output Power[kVA]	50	100
	Nominal Voltage[Vac]&Grid Frequency[Hz]	220/380 230/400&50/60	220/380 230/400&50/60
	Rated Output Current[A]	72	144
	THDi (Total Harmonic Current Distortion)	<3%	<3%
AC (Off-Grid)	Wiring	3-Phase 3-Wire / 3-Phase 4-Wire	3-Phase 3-Wire / 3-Phase 4-Wire
	Maximum Output Power[kVA]	55	110
	Nominal Output Power[kVA]	50	100
	Nominal Voltage[Vac]&Grid Frequency[Hz]	220/380 230/400&50/60	220/380 230/400&50/60
	Rated Output Current[A]	72	144
	THDi	<3%	<3%

Protection	Over Current Protection	√	√
	Anti-Islanding Protection	√	√
	Reverse Connection Protection	√	√
	Fault Detect	√	√
	Overload Protection	√	√
	Insulation Detect	√	√
	AC Short-circuit Protection	√	√
	Air Conditioner	√	√
	Fire Fighting	√	√
	Water Logging	√	√
	Access Control	√	√
General	Dimension W*D*H [mm]	1500*1500*2000	1700*1350*2200
	Cabinet Weigh[kg]	1200	1600
	Operation Temperature[ ]	0-55	0-55
	Noise[dB]	<25	<25
	Cooling Mode	Air cooling	Air cooling
	Operate Altitude[m]	<2000	<2000
	Operation Humidity[RH]	<90	<90
	IP	IP65	IP65
	Protocol	CAN/Modbus/LAN/4G	CAN/Modbus/LAN/4G
	Display	LCD	LCD
	Standard	GB/T 36276 IEC62619 UN38.3	

2.9 Stacked House BESS





Stacked house BESS adopts modular design, the product is serial-connected through the battery module series to improve the system voltage and capacity, can match a variety of brands of inverters.

The inverter can be connected to the solar photovoltaic power generation system, and can connect 2 MPPT channels, compatible with up to 6kW PV input power.

With double leakage protection and AC/DC hardware isolation design, it is safer for users.

Convection heat dissipation design, more friendly to high temperature working environment.

Equipped with an intelligent network monitoring platform and APP, easy to monitor the real-time operation status.

Built-in DC/AC safety isolation system for easy transportation and installation.

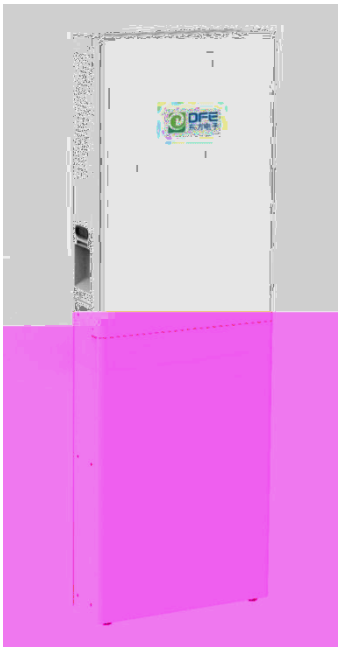
Thin and light design, better experience.

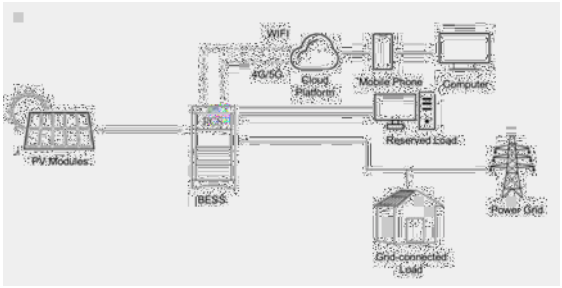
Technical Specification

Item	Details	Specification		
		Product A	Product B	Product C
PV Input	Maximum Power[kW]	4.6	7	7
	Maximum Input Voltage & Nominal Voltage[V]	550	550	550
	Start Voltage & MPPT Voltage Range[V]	125-500	125-500	125-500
	MPPT Maximum Short-Circuit Current[A]	17.5	17.5	17.5
	MPPT Maximum Input Current[A]	14	14	14
PACK	Battery Type	LFP	LFP	LFP

	Nominal Battery Voltage[V]	102.4	204.8	307.2
	Voltage Range[V]	40-58.4	40-58.4	40-58.4
	Maximum Charge & Discharge Current[A]	95/75	95/105	95/110
	Battery Capacity[Ah]	50	50	50
	Energy Capacity[kWh]	5.12	10.24	15.36
	Available Capacity[kWh]	4.6	9.21	13.82
	Communication Interface	RS485/CAN /WiFi	RS485/CAN /WiFi	RS485/CAN /WiFi
AC Grid-Connection	Nominal Output Power[kW]	3.68	5	6
	Nominal Voltage[Vac]&Grid Frequency[Hz]	230&50/60	230&50/60	230&50/60
	Rated Output Current[A]	16	21.7	26
	THD(i)	<3%	<3%	<3%
AC Off-Grid	Maximum Output Power[kW]	3.68	5	6
	Nominal Voltage[Vac] & Grid Frequency[Hz]	230/176-270&50/60	230/176-270&50/60	230/176-270&50/60
	Rated Output Current[A]	16	21.7	26
Efficiency PV Side	Maximum Efficiency	99.9%	99.9%	99.9%
	European Efficiency	97%	97%	97%
Protection	Over Current Protection	√	√	√
	Reverse Connection Protection	√	√	√
	Fault Detect	√	√	√
	Overload Protection	√	√	√
	Insulation Detect	√	√	√
	AC Short-circuit Protection	√	√	√
General	Dimension W*D*H [mm]	600*240*730	600*240*1230	600*240*1730
	Cabinet Weigh[kg]	68	106	144
	Operation Temperature[ ]	0-55	0-55	0-55
	Noise[dB]	<25	<25	<25
	Cooling Mode	N/A	N/A	N/A
	Operate Altitude[m]	<2000	<2000	<2000
	Operation Humidity[RH]	<90	<90	<90
	IP	IP65	IP65	IP65
	Protocol	CAN/Modbus	CAN/Modbus	CAN/Modbus
	Display	LCD	LCD	LCD
	Standard	GB-T 36276 IEC62619 UL1973 UN38.3		

2.10 Integrated House BESS





The integrated house energy storage system integrates the battery management system(BMS), power conversion system(PCS), local monitoring system(EMS), air conditioning, fire protection, power distribution and other devices in the energy storage outdoor cabinet, and adopts a modular design to create low-carbon and high-yield solutions for different application scenarios.

The inverter can be connected to the solar photovoltaic power generation system, and can connect 2 MPPT channels, compatible with up to 6kW PV input power.

With double leakage protection and AC/DC hardware isolation design, it is safer for users.

Convection heat dissipation design, more friendly to high temperature working environment.

Equipped with an intelligent network monitoring platform and APP, easy to monitor real-time operation status.

Built-in DC/AC safety isolation system for easy transportation and installation.

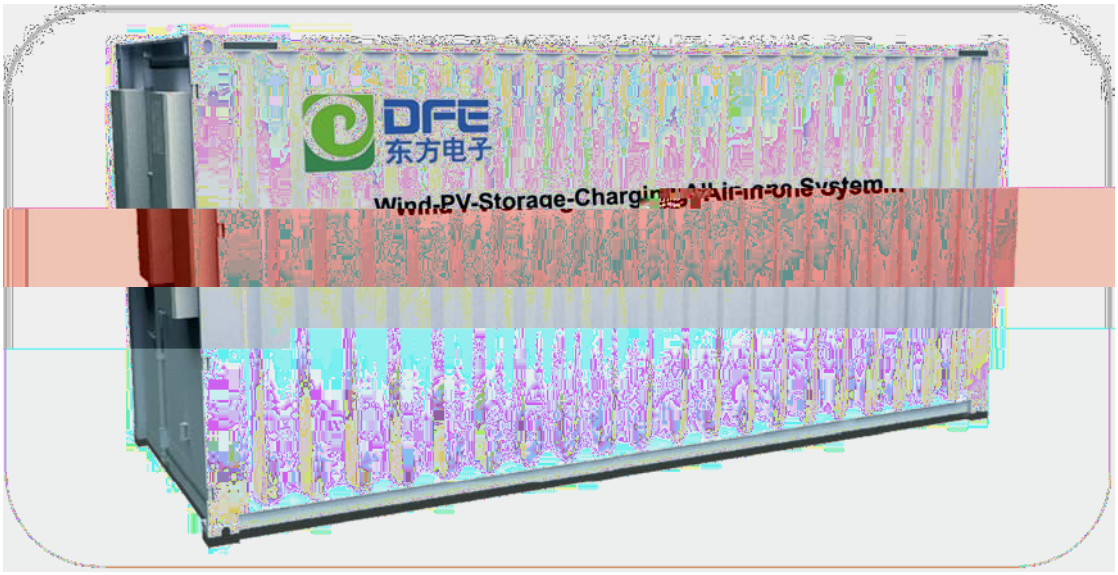
Thin and light design, better experience

Technical Specification

Item	Details	Specification	
		Product A	Product B
PV Input	Maximum Power[kW]	4.6	7
	Maximum Input Voltage & Nominal Voltage[V]	550	550
	Start Voltage & MPPT Voltage Range[V]	125-500	125-500
	MPPT Nos	2/1	2/1
	MPPT Maximum Short-Circuit Current[A]	17.5	17.5

	MPPT Maximum Input Current[A]	14	14
PACK	Battery Type	LFP	LFP
	Nominal Battery Voltage[V]	51.2	51.2
	Module Voltage Range[V]	20-29.2	20-29.2
	Charging Voltage Range[V]	40-58.4	40-58.4
	Maximum Charge & Discharge Current[A]	95/75	95/105
	Battery Capacity[Ah]	100	200
	Energy Capacity[kWh]	5.12	10.24
	Available Capacity[kWh]	4.6	9.21
	Communication Interface	RS485/CAN	RS485/CAN
AC (Grid-Connected)	Nominal Output Power[kW]	3.68	5
	Nominal Voltage[Vac]&Grid Frequency[Hz]	230&50/60	230&50/60
	Rated Output Current[A]	16	21.7
	THDi	<3%	<3%
AC (Off-Grid)	Maximum Output Power[kW]	3.68	5
	Nominal Voltage[Vac]&Grid Frequency[Hz]	230/176-270&50/60	230/176-270&50/60
	Rated Output Current[A]	16	21.7
Efficiency PV Side	Maximum Efficiency	99.9%	99.9%
	European Efficiency	97%	97%
Protection	Over Current Protection	√	√
	Reverse Connection Protection	√	√
	Fault Detect	√	√
	Overload Protection	√	√
	Insulation Detect	√	√
	AC Short-circuit Protection	√	√
General	Dimension (W*D*H) [mm]	625*275*1865	625*275*1865
	Cabinet Weigh[kg]	115	155
	Operation Temperature[ ]	0-55	0-55
	Noise[dB]	<25	<25
	Cooling Mode	N/A	N/A
	Operate Altitude[m]	<2000	<2000
	Operation Humidity[RH]	<90	<90
	IP	IP65	IP65
	Protocol	CAN/Modbus	CAN/Modbus
	Display	LCD	LCD
	Standard	GB-T36276, IEC62619, UL1973, AS/NZS 5139, UN38.3	

2.11 Wind-PV-Storage-Charging All-in-one System



Suitable to

Industrial and Commercial Enterprise
PV system for Green House
DC system for Island
DC system for Industrial Park

Functions

Urban green building Photovoltaic - Energy storage-DC flexible power supply
Energy Storage in smart power distribution area
Field power supply
Oilfield power supply and energy saving
Distributed energy DC coupled grid-connected power supply
Multiple energy sources complement each other comprehensively
Emergency power supply

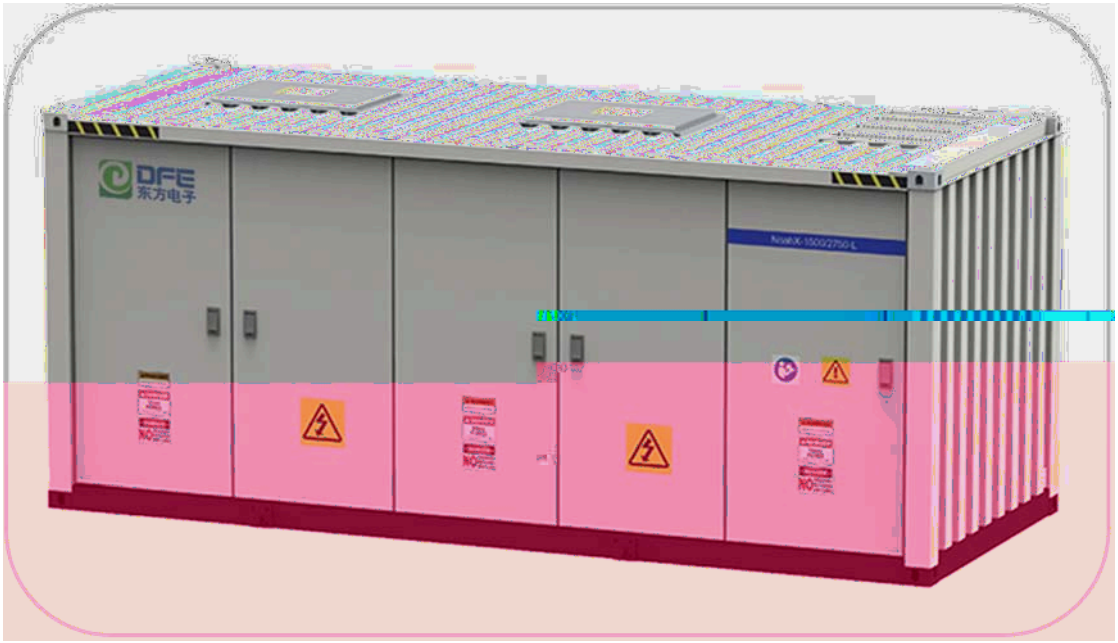
Features

Be used to build DC system: It will interconnect various energy sources to achieve comprehensive utilization and reduce the pressure caused by the rapid expansion of the power grid.
Standard Interface: It can connect wind power, photovoltaic, energy storage battery, V2G and other equipment through standardized interface. And the DC output parameters can be adjusted.
Wide volage range design: Photovoltaic input port, wind power input port, battery input port voltage range is wide.
DC bus Micro-Grid can be constructed with high efficiency and good economy.

Technical Specification

Battery Connection Port	
Rated Power (kW)	200
Maximum Current (A)	440
Battery Voltage Range (V)	200-850
Battery Capacity	430kWh
PV Connection Port	
Rated Power (KWp)	200
Maximum PV input Current (A)	440
Input DC Voltage Range (V)	200-850
Number of MPPT	4
Wind Power Input Port	
Rated Power (kW)	200
Wind Power Conversion Power(kW)	200
Maximum Current (A)	440
DC750V Load Port (V2G)	
Rated Power (kW)	200
Rated Output Voltage (V)	600-800(Adjustable)
Maximum Output Current (A)	286
Grid-Connected Input Port	
Rated Power (kW)	50
Rated Output Voltage (V)	400V
Output Frequency (Hz)	50
AC Wiring	3-Phase 4-Wire
Others	
Communication Interface	RS485/CAN…
Protocol	Modbus-RTU/TCP
Noise	≤65DB
Cooling Mode	Forced air cooling
Operation Temperature (°C)	-20~+45

2.12 Liquid Cooling Energy Storage System



Suitable to

Power generation side
Power grid side
User side
Micro-grid system

Functions

Peak shaving
Smooth output
Peak regulation and frequency regulation
Emergency power supply

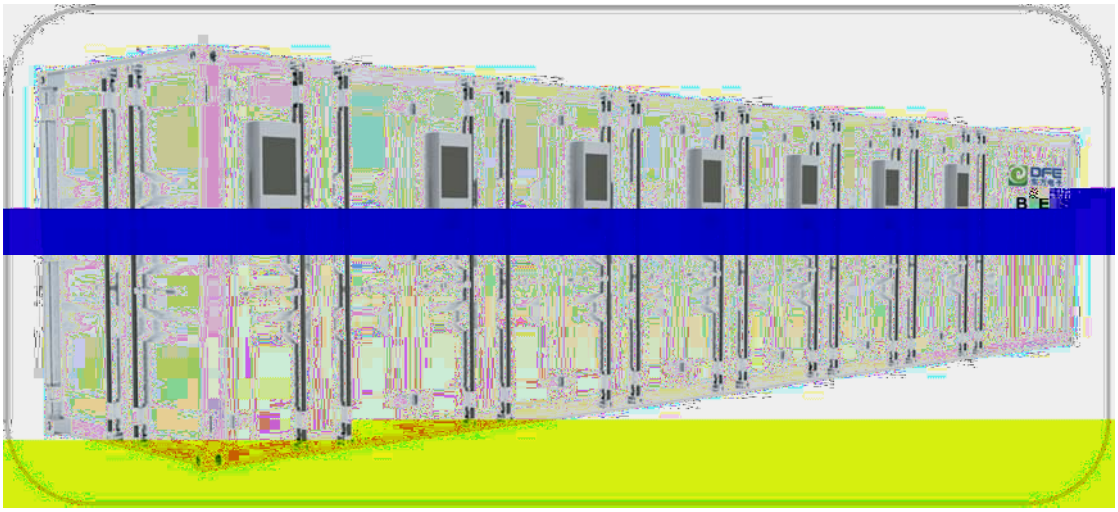
Features

IP54 protection grade for outdoor applications
Prevention based fire fighting strategy with independent fire fighting system
Highly integrated, modular design, 1000V/1500V system
Electric and battery separation design, easy to maintain
Non-walk-in/modular highly integrated design saves 35% space
The liquid cooling extreme temperature control system is adopted, and the temperature difference of the battery cell inside the battery cluster is less than 3

Technical Specification

Type	3.44MWh	3.72MWh
Battery Module		
C-Rate	≤1C	
Cell Type	LFP	
Cell Capacity	280Ah	
Combine Mode	1P48S	1P52S
Rated Energy	43.008kWh	46.592kWh
Nominal Voltage	153.6V	166.4V
Battery Cluster		
Combination Mode	1P384S	1P416S
Rated Energy	344.064kWh	372.736kWh
Nominal Voltage	1228.8V	1331.2V
Operation Voltage Range	1075.2V~1401.6V	1164.8V~1500V
Battery System		
Rated Energy	3440.64kWh	3727.36kWh
Nominal Voltage	1228.8V	1331.2V
Operation Voltage Range	1075.2V~1401.6V	1164.8V~1500V
Dimension	20feet	
Weight(Ton)	≤35	≤38
Operation Temperature Range	-30 ~50	
Store Temperature Range	-30 ~55	
Maximum Operation Altitude	≤4000	
Battery Temperature Control Mode	Liquid Cooling	
Fire Extinguishing System	Perfluorohexanone	
Interface	Ethernet	
Protocol	Modbus RTU/TCP, IEC104	
IP	IP54	

2.13 Wind Cooling Energy Storage System



Suitable to

- Power generation side
- Power grid side
- User side
- Micro-grid system

Functions

- Peak shaving
- Smooth output
- Peak regulation and frequency regulation
- Emergency power supply

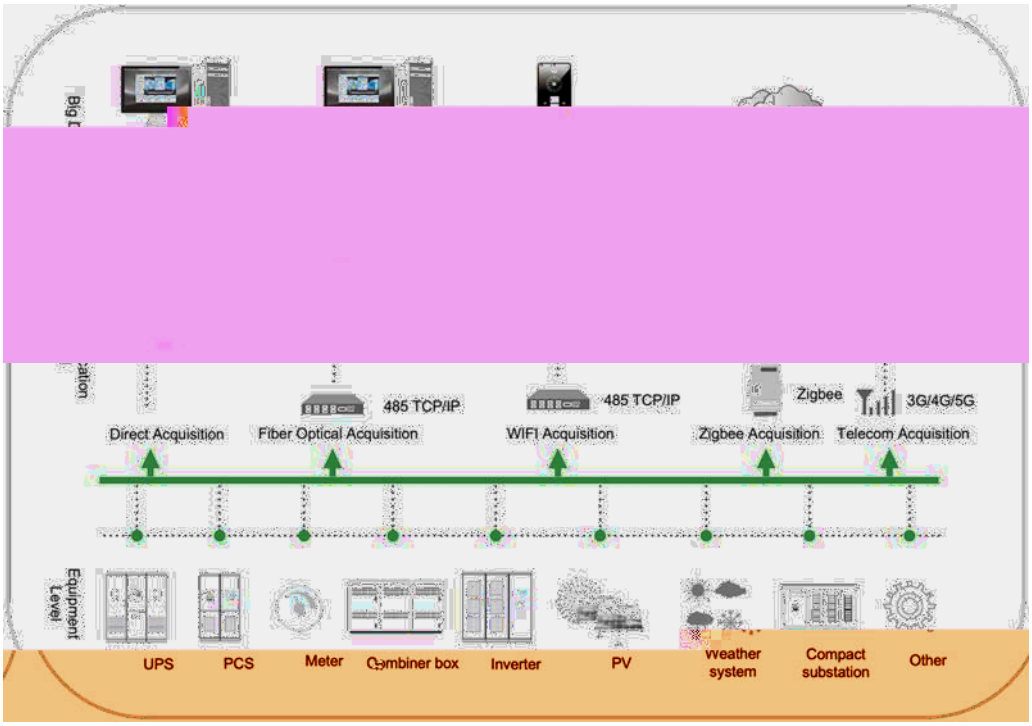
Features

- Master-slave three-layer architecture BMS, stable link
- Multilevel protection: pack, cluster, array, and system are all protected
- Intelligent air conditioning control, so that it can work efficiently, reduce system losses, extend life
- Integrated design, unified external interface
- A 45-foot container can contain 5MWh

Technical Specification

Battery Module	
C-Rate	≤1C
Cell Type	LFP
Cell Capacity	280Ah
Combination Mode	1P16S
Rated capacity	280Ah
Rated Energy	14.336kHh
Nominal Voltage	51.2V
Battery Cluster	
Arrangement	One cluster with three Columns
Cell Capacity	280Ah
Combine Mode	1P400S
Key Components	25 Battery Modules, 1 High Voltage Cabinet
C-Rate	≤1C
Rated Capacity	280Ah
Rated Energy	358.4kWh
Nominal Voltage	1280V
Operation Voltage Range	1000V~1460V
Battery System	
Arrangement	2 array, 7 clusters per array
Cell Capacity	280Ah
C-Rate	≤1C
Array Mode	7P400S*2 arrays
Rated Capacity	1960Ah*2 arrays
Rated Energy	5017.6kWh
Nominal Voltage	1280V
Operation Voltage Range	1000V~1460V
Dimension	13716mm*2896mm*2438mm
Weight(T)	≤55
Operation Temperature Range	-30 ~50
Store Temperature Range	-30 ~55
Maximum Operation Altitude	≤4000
Battery Temperature Control Mode	Industrial Air Conditioner
Fire Fighting System	Heptafluoropropane
Interface	Ethernet
Protocol	Modbus RTU/Modbus TCP/IEC104
IP	IP54

2.14 Energy Management System (EMS)



Features

- Integrated architecture design
- Good adaptability to power grid
- Plenty of control way
- Flexible control mode
- Accuracy control
- Blocking function

Functions

- Primary frequency regulation
- Smooth and stable control
- AGC/AVC control
- SOC automatic maintenance
- Automatic grid-connected and off-grid switching
- Planned operation control
- Anti-reverse current control
- Data acquisition and monitoring

Technical Specification

EMS	
Accuracy of the control operation	100%
Accuracy of the remote control	100%
Pass rate of measurement value	100%
System availability	100%
MTBF	≥20000h
Sampling interval in historical curve	1-60Min (Adjustable)
Daily & monthly report storage time in historical curve	≥1 Year
Maximum recovery time of the whole station system	≤5Min
Transmission time for digital input change	<1Min
Transmission time for digital output and analog output command	<2Min
Real-time data scanning interval	1-10s Adjustable
Real-time data transfer time in computer remote network communication	<10s
Graphics call response time	<2s
Real-time data refresh cycle on the graphics	2~10s Adjustable

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